

CLAIMS

1. A liquid drop discharge head, comprising:  
a nozzle configured to discharge a liquid  
5 drop by using a piezoelectric element;  
wherein lead ingredients are not included in  
the piezoelectric element.

2. The liquid drop discharge head as claimed  
10 in claim 1,  
wherein main ingredients of the  
piezoelectric element are materials having a  
perovskite type crystal structure not including lead.

15 3. The liquid drop discharge head as claimed  
in claim 2,  
wherein main ingredients of the  
piezoelectric element are barium titanate.

20 4. The liquid drop discharge head as claimed  
in claim 2,  
wherein main ingredients of the  
piezoelectric element are potassium niobate.

25 5. The liquid drop discharge head as claimed

in claim 2,

wherein main ingredients of the  
piezoelectric element are bismuth sodium titanate.

5                   6. The liquid drop discharge head as claimed  
in claim 2,

wherein main ingredients of the  
piezoelectric element are nickel sodium titanate.

10                   7. The liquid drop discharge head as claimed  
in claim 1,

wherein main ingredients of the  
piezoelectric element are materials having a tungsten  
bronze type crystal structure.

15                   8. The liquid drop discharge head as claimed  
in claim 7,

wherein main ingredients of the  
piezoelectric element are  $\text{Ba}_2\text{NaNb}_5\text{O}_{15}$ .

20                   9. The liquid drop discharge head as claimed  
in claim 1,

wherein main ingredients of the  
piezoelectric element are materials having a bismuth  
25 layered compound.

10. The liquid drop discharge head as  
claimed in claim 9,

wherein main ingredients of the  
5 piezoelectric element are  $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ .

11. A liquid drop discharge device,  
comprising:

a liquid drop discharge head configured to  
10 discharge a liquid drop;

wherein the liquid drop discharge head  
includes a nozzle configured to discharge the liquid  
drop by using a piezoelectric element, and

lead ingredients are not included in the  
15 piezoelectric element.

12. An image forming device configured to  
form an image on a recording medium by discharging a  
liquid drop of recording liquid, comprising:

20 a liquid drop discharge head configured to  
discharge the liquid drop;

wherein the liquid drop discharge head  
includes a nozzle configured to discharge the liquid  
drop by using a piezoelectric element, and

25 lead ingredients are not included in the

piezoelectric element.

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